



The Power Project

A Bird's Eye View



Volume 4

No. 6

JUNE, 1959

INTERNATIONAL PAPER COMPANY
NIAGARA FALLS, N. Y.



About Our Cover



Photo by the Editor

Power! Symbolic of kilowatts soon to be generated at the Lewiston site of the SPA Project is the Euclid truck on our cover. Powerful in its own right as a truck among trucks, it is capable of withstanding many hours of punishing abuse.

Regardless of weather, the mighty Euc's roar can be heard many city blocks away as boulder by boulder, ton by ton, the whittling away of Dame Nature's earth surface takes place and the gradual outline of the SPA Project becomes more readily visible.

Power! A mighty roar! The roar of motors! The roar of Niagara — symbolic of progress and the future of the area.

In Appreciation

For the cooperation extended to us in assembling material for our Power Project story, we say "many thanks" to the power Authority of the State of New York; to Mr. D. E. Stinson, Project Manager and Mr. Dale Vosburg, Safety Engineer of Balf, Savin and Winkleman, General Contractors.

The Editor

Photos by SPA and the Mill Roll Editor

POWER PLUS

Under construction in Niagara Falls, N. Y. is the largest power project in the free world.

Niagara Falls, N.Y., is the site of a construction project whose immensity and magnitude is almost beyond description. The first generation of power is scheduled for the spring of 1961 and the target date for project completion is set for July, 1962. The project is the largest of its type in the United States and the entire free world.

A few statistics about the project and its construction are as follows: The Lewiston Power Plant length is 1,840 ft. housing 13 generating units with 150,000 kilowatt capacity each. Parts for 1 generating unit requires 35 railroad cars for shipment plus special cars for the 200,000 H.P. turbines. The total height from plant intake to tail race is 376 ft. Penstocks are 480 ft. long and 28 ft. in diameter.

The Tuscarora Pump Generating Plant will be 971 ft. long and 145 ft. high, housing 12 pump generators with a 37,500 H.P./20,000 K.W. capacity.

The upper river intake structures will each be 840 ft. long. A 3,000 ft. rock dike will be built from the tip of Buck Horn Island for effective water flow. The river bottom is being excavated in the general intake area as well.

Conduits will each be 46 ft. wide and 66 ft. from base to the crown of roof. They will be approximately 22,000 ft. long. The open canal length will be 4,800 ft. in length.

Each major section has its own concrete batch plant which is fully automatic, complete with recording devices measuring components of each batch mixed. The aggregate plant where 5 ft. boulders are crushed to 6 in. and less stones has a capacity of 2,000 tons per hour. It is estimated that 10,400,000 tons of aggregate are required for the entire project.

There will be 39 million cubic yds. of excavation on the entire project. If placed in one pile, it would equal a block one mile square and 38 ft. high.

Total concrete used will amount to 3½ million cubic yds. which is equal to the amount used in the New York State Thruway from New York City to Buffalo plus that used in the Queen Elizabeth Highway from the border to Toronto, Canada. 157,500 tons of steel will be used throughout the project which, if used in automotive production, would turn out 105,000 standard American automobiles.

What does the equipment cost that we see in use? A Euclid truck costs approximately \$35,000. The 6 yd. drag line shovels average \$300,000 and the giant bulldozers are in the \$30,000 category.

Incidental items connected with the construction of the project include: relocating railroads and highways; the relocation of towers and high tension wires of existing power transmission lines; the relocation of 72 residences in the Hyde Park area.

Financing of the entire project has been carried out through the sale of bonds. No tax revenue has been used in the total cost estimate of approximately 720 million dollars.

Development and rebuilding of existing roads and parkways is a direct offshoot of the SPA project. When completed, the scenic beauty of the area will be enhanced for those wishing to behold Mother Nature's gift of "Mighty Niagara."

WATERWAYS

This view, from 5,000 feet above the Upper Niagara River, shows the intake construction site within cofferdam in foreground. Also shown is route of the twin covered conduit, running northward toward open canal and two generating plants.





SECTION No. 1—General view looking north along conduit excavation. River in foreground is being unwatered within intake cofferdam. Three bridges under construction across conduit excavations are, front to rear, Niagara Junction Railway, Buffalo Avenue and "A" Street.

WATERWAYS

INTAKE—The Industrial Water Intake is in full operation and removal of temporary cofferdam is nearing completion.





WATERWAYS - No. 2

Low altitude aerial view showing relocation activities at New York Central tracks south of Lockport Road. Temporary fill is being placed in conduit excavations to provide readbed for temporary diversion of rail traffic during removal of "plug" section. Gill Creek diversion channel is at right.



RELOCATED FACILITIES

Linemen are shown making conductor to insulator tie-ins on relocated 69 KV Line No. 6, north of Lockport Road bridge.



Transition from covered conduit to open canal is shown in this low aerial view looking southeast into Section 3; Witmer Road crossing is in mid-background.



Three minutes after blast (foreground) — 2,600 pounds of dynamite were used in the blast which heaved the bed rock in the center of conduit section 3.

Scaling on east wall of conduit 1, section 3. Scaling operations were taking place between Station 181 and 183.



DRILLING AROUND THE CLOCK



DAY



NIGHT

**WATERWAYS - SECTION 4**

End of conduits . . . start of open canal.

**TUSCARORA PUMP/
GENERATING PLANT**

This view, looking northeastward into Tuscarora Pump/Generating Plant excavation, shows drilling and loading operations in progress.

**WATERWAYS - SECTION 4**

Two shovels and five side dumps remove blasted rock from the open canal excavation in Work Section 4.



TUSCARORA PUMP/GENERATING PLANT—Fabrication of ribs for draft tube forms for Tuscarora Pump/Generating Plant. Work is in contractor's carpenter shop near site.



AGGREGATE PLANT—Largest in the world with a capacity of 2,000 tons an hour.



GIANTS OF CONSTRUCTION—A 6-yard drag line shovel, a Euclid truck and a giant bulldozer team up in excavation work on the largest power project in the free world.



WATERWAYS - SECTION 3 — Workmen assemble prototype of steel reinforcement for section of conduit arch.



RESERVOIR—Bob Hagan, grout plant operator and Lionel Barrick, headerman, adjust head pressure, curtain grouting operations at Station 057-02 on centerline of north dike wall in reservoir area.



Aerial view from 2,000 feet showing progress of excavation at Niagara Generating Plant
Temporary relocation of Lewiston Road separates plant site from forebay excavation.

Excavation for the Niagara Generating Plant reflects shape of structure's foundation on face of gorge as material removed totals more than 7,300,000 cubic yards. Open canal connects plant with Tuscarora Pump/Generating Plant site a mile east (background). Route of covered conduits is shown as excavation scar at upper right. Aggregate Plant and Visitors' Building are beyond conduit at right center. University siding is on opposite (near) side of conduit. Military Road cuts diagonally across view in background.



Hewn from solid rock are the sections in which will be built the penstocks carrying water to the lower Niagara.



Niagara Generating Plant

Niagara Generating Plant. The canal and river to the left and the improved area of the Niagara River to the right are generating units. The building in the background contains the power. To the right the public Observation Bridge spans the canal and Mainland Bridge.





NIAGARA GENERATING PLANT—Bulk material from the Niagara Generating Plant excavation—more than 7,300,000 cubic yards to date—has been wasted in the Lewiston spoil area. Looking west across Lewiston Road, spoil area's tremendous volume is apparent. When completed site will be rendered suitable for possible residential development.



NIAGARA GENERATING PLANT—Powder men load 30' deep holes preparatory to blasting operations while drill rigs in background continue to drill pattern of holes prior to loading.



NIAGARA GENERATING PLANT—Workmen place sheeting on a draft tube form for Niagara Generating Plant at carpenter shop on Lewiston spoil area.

PARKWAYS



General view of parkway construction at Prospect Point. Demolition of old buildings along Riverway is nearing completion. Foundation for Elevator Observation Tower is near base of American Falls at lower right.



Area developments incidental to construction of the Niagara Power Project include improvements to Goat Island and a new bridge across the American Rapids. This low altitude aerial view shows fill operations in progress at upstream end of island and partially completed bridge abutments beyond.



Material from conduit excavations is being placed along shoreline of Upper Niagara River as Parkway fill. At left, temporary diversion of Gill Creek allows removal of overburden preparatory to construction of culvert. Unwatering within river intake cofferdam nears completion in right background.